

REMARKS:

In the outstanding Office Action, claims 11, 12, 14, 15, 17 and 18 were rejected. Claims 1-10, 13 and 16 stand cancelled. Thus, claims 11, 12, 14, 15, 17 and 18 are pending and under consideration. No new matter has been added. The rejections are traversed below.

REJECTION UNDER 35 U.S.C. §102(e):

In the outstanding Office Action, claims 11, 12, 14, 15, 17 and 18 were rejected under 35 U.S.C. §102(2) as being anticipated by U.S. Patent No. 6,108,775 ('775).

'775 discusses dynamically reloadable pattern history tables in a multitasking microprocessor to provide branch prediction by switching a branch prediction table based upon program type in which relevant branching instructions are contained.

The present invention discloses a branch prediction method where initialization is performed according to a branch destination address.

The Examiner compares the '775 method of branch prediction by switching a branch prediction table based upon program type in which relevant branching instructions are contained with the present invention. In '775, a fetch unit having branch target buffer (BTB) stores data indicating prior history of branches from which the current instance of a branching instruction may be predicted (see, column 8, lines 20-27 of '775). The BTB operates in combination with multiple pattern history tables (PHTs) for storing branch pattern history-based prediction codes (see, column 8, lines 27-37 of '775), and the fetch unit includes PHT read/write circuitry that is in communication with each of the multiple PHTs (see, column 8, lines 49-52 of '775). The '775 method then effects communication of contents of a selected one of PHTs to/from memory in the event of a task switch so that dedicated pattern history for a particular task may be maintained (see, column 8, lines 52-59 of '775). The '775 method is directed to switching the PHTs based on a program type (see, column 10, lines 41-55 and column 11, lines 27-31 of '775), and updating (not initialization) the PHT by the BTB/PHT update logic according to whether the associated branches were successfully predicted or mispredicted (see, column 13, lines 40-47 of '775). This means that because the branch prediction data is determined according to a branch history, precise branch predictions can only be achieved by storing a sufficient number of branch prediction hit/miss results in the PHT.

As further shown in FIG. 3 of '775, the update logic (70) is used for updating the branch prediction table. This means that when a program is switched, the PHT is not initialized.

Instead, one of a plurality of PHTs is selected for the program and is updated according to an actual result of branch prediction performed for each branch instruction included in the program (see, column 9, lines 3-9 of '775).

In contrast, the present invention includes "initializing branch prediction information" when it is detected that "the process is switched", thereby preventing a branch prediction from being performed according to a past process (see, claims 12, 15 and 18 of the present application). Further, the branch initialization is performed "according to a branch destination of the branch instruction" as recited in independent claims 12, 15 and 18. The '775 system does not teach or suggest "initializing branch prediction information" when "a process switch" is detected because the '775 system is directed to updating the branch prediction data according to the branch history. By initializing the branch prediction information the present invention does not require maintenance or storing of a large number of branch prediction hit/miss results.

The '775 method does not teach, disclose or suggest "initialization of branch prediction information".

It is therefore submitted that the independent claims are patentable over '775.

For at least the above-mentioned reasons, claims depending from independent claims 12, 15 and 18 are patentably distinguishable over '775. The dependent claims are also independently patentable. For example, as recited in each of the dependent claims 11, 14 and 17, the fourth part performs "initialization based on prediction information given to the branch instruction". The '775 method does not teach or suggest providing "initialization" instead, discusses updating contents of entries of the BTB according to whether the associated branches were successfully predicted or mispredicted (see, column 13, lines 40-46 of '775).

Therefore, withdrawal of the finality of the rejection is respectfully requested.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding rejections have been overcome, and further, that all pending claims patentably distinguish over the prior art.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

If there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

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If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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